

Contraception calculator

The use of the pill for contraception is accompanied by side effects and affects a woman's hormonal balance. The Ogino-Knaus method, although it must be learnt and requires manual recording and evaluation of data, has therefore [lacuna]. For this reason, the invention proposes:

contraception using the

10 OGINO-KNAUS CALCULATOR.

The machine comprises
digital clock (possibly with date)
charging and battery part with automatic
changeover

15 temperature measurement sensor

acoustic signal generator

input keys

display keys

security keys against unauthorized use

20 calculator, simultaneously controlling the
following domains:

clock, temperature measurement, data
recording, data evaluation, battery
checking, displays, lamps

25 lamps

possibly magnetic cassette for data storage
(can be evaluated in a medical computer at the
gynaecologist's).

The machine is intended to perform the
30 following tasks:

a) clock with alarm, possibly with date

b) clinical thermometer

c) contraception calculation based on 3 methods
simultaneously

35 d) advise doctor's appointment

I) using the method based on the cycle length
after which a woman is fertile in the interval (min. CL
- 18, max. CL - 10),

II) using the temperature measurement method
(earl. temp. change -6, temp. change +3)

III) using the temperature measurement method,
taking the last measurement as a basis (1, temp. change
5 +3).

The reliability of the indications is almost as
high with method III) as with the pill = ovulation
inhibitor.

The reliability is output in % on the clock
10 display, as is other data after the appropriate display
key has been pressed for 1/2 min. Methods I) and II)
are estimates based on the variation in the data. The
calculator searches for the method for which it has the
best data and most reliable results available. If the
15 data is also recorded on a cassette, the gynaecologist
can quickly obtain an overview of the problems on a
dedicated medical calculator, using the cassette. Exact
orientation is also possible for the husband without
any psychological difficulty, because the lamps
20 indicate the safe time.

Morning temperature measurement

The alarm signals when it is time to get up and
take a measurement. The sensor is taken from the
holder, the alarm switches itself off, and the
25 appliance is switched over from the mains to the
battery for voltage protection. The measurement process
starts. The second alarm indicates the end of
measurement. The sensor is put back in the holder and
data processing starts after the security keys and the
30 temperature entry keys have been pressed during a third
control buzzer. Further input keys can be actuated
immediately or else during the day. For cleaning
purposes, the measurement sensor is attached to a
waterproof cable and can be fitted into the appliance.
35 The appliance runs on an isolating transformer. On
trips, the appliance is battery-operated; the digit
displays are then turned off, and solar cells can also
be used for the power supply (developing countries).
If, during data processing, there is another entry,

this is temporarily stored and then used in a second cycle, or no buzzer is sounded, i.e. data is entered again.

The evaluation algorithms must achieve the following:

- 5 A) indicate whether it is necessary to go to the doctor's,
 B) indicate whether it is a safe day,
 C) select the correct method I) and II) or III) for this,
10 D) and calculate probabilities of this,
 E) take into account and possibly interpolate missing values, and calculate the following values and put them into a memory:
 Temperature, date and all other data from the
15 input keys
 Days since last period
 Length of max. cycle
 Length of min. cycle, possibly not taking into account data from a long time ago through dual
20 storage
 Earl. temperature rise
 Lat. temperature rise
 Length of last period
 Calculate day of temperature rise
25 Display keys
 turn clock display off for one min.
 1) temperature measured: this also turns the appliance into a simple clinical thermometer. Pressing it displays the measured value, and pressing it a 2nd
30 time within the next minute displays the temperature for the day before and so on for all temperature entries from the last few days. After 8 min., alarm can be made to buzz.
 2) days since last period (day of period)
35 x 3) max. period: days
 x 4) min. period: days
 x 5) earliest temperature rise: period day
 x 6) latest temperature rise: period day

x 7) days until change: from safe to unsafe, or otherwise accordingly

8) length of period: first press for last period, second press for last but one etc. up to third
5 period

9) reliability in %: indication of the % reliability of computer statement from lamp displays. If a display key has been pressed for 1 min. previously, latter's statement..

10 (x means input option along with value input key within 1 min. of it being pressed. Each press of the x key increases the value on the clock display by 1, starting from 0. 1 min. after the last press, the clock is turned on again and the last value displayed
15 is stored)

(poss. combination with clock adjustment)

(poss. contact for additional time switch for radio)

Lamps

- 20 1) green: safe time, how safe see above
2) red: unsafe time, see above
3) blue: seek medical advice

If red and green light up simultaneously, no indication is possible.

- 25 4) red: mains and battery check: if the power fails, the battery is automatically used, the lamp is turned on and the clock display is turned off; during battery operation, if 2/3 empty, then red.

Only pressing the two security keys at the same
30 time enables the operation of

Input keys

(B means buzzer is sounding or light when depressed)

- 1) B clear last entry: the input key pressed
35 subsequently clears the appropriate function

2) B temperature entry: the temperature measured by the temperature sensor and displayed by the analogue/digital converter is stored in a cell which

was selected using the built-in clock and the calculator.

3) B period entry: a bit is set in the cell selected as above

5 4) B mucus: ditto

5) B illness or medicaments: ditto

6) B awake at night: ditto

7) B value input: after pressing the key, the clock display is turned off for 1 min. and the values
10 can be entered using the appropriate display keys. These values are enumerated sequentially on the clock display for visual checking.

For security from playing children, the two security keys are built in, although these can be
15 turned off by changing over the appliance. They are located on the front and back of the appliance. The changeover switch is located on the base of the appliance in the form of a penny-slot switch. A second changeover switch switches over between mains and
20 battery operation. The clock display is turned off and, for 1 min., a separate key can be turned on instead.

(Security key)

Other entries can be important for the doctor:

8) B intercourse

25 9) Sickness, vomiting / B

10) B heavy period

11) B discharge

Memory (poss. on cassettes)

Besides the program memory and the
30 computational registers, the following memories need to be present:

1. $2^6 = 64 = 39 + 25$ memory cells for the entry of daily features

35 Temperature in 5 or 6 bits from 36 - 39.2°C min. = no entry

Period: 1 bit

Mucus: 1 bit

Illness: 1 bit

Awake at night: 1 bit organized as a stack

39 days for normal menstruation, the other 25 to recognize irregular intermenstrual bleeding or excessively long periods

2. Register: 6 bits to indicate the period day.
5 It is advanced to 8.00 pm, since periods are counted from then on to the next day.

3. Register: 4 bits to indicate the number of periods up to 16. Then recalculation as described below.

10 4. Register: 3 times 4 bits for the lengths of the last 3 periods

5. Max. period register: 2 times 4 bits. The values are obtained by adding to the min. PR. Thus, only spacing stored.

15 6. Min. PR: 2 times 5 bits.

7. Earliest temperature rise: 2 x 4 bits: since the earl. temperature rise is not to be expected before the 8th day, values obtained by adding 8.

20 8. Latest t.: 2 times 4 bits: values can be obtained by adding earl. t.: hence, only spacing stored.

When register 3 is full, registers 4, 5, 6, 7 are re-stored on the basis of the following calculation:

25 The values for the last 8 (16) periods have been optimized in the NEW memory parts. The values are re-stored on the basis of OLD and then NEW is cleared.

In this way, values which are not too old are used for the calculation relating to OLD and NEW; thus,
30 as a rule, 32 values taken into account. = 2.8 years or 16 values 1.4 years, if just re-stored.

Patent Claims:

Contraception calculator, characterized in that

- 5 1. it incorporates a digital clock, an electronic thermometer, an acoustic signal generator, a battery/charging part, input keys, display keys, security keys, lamps, possibly a magnetic cassette and a microprocessor for simultaneously controlling all the parts;
- 10 2. it performs the following tasks: clock with alarm and date, a clinical thermometer, contraception calculation based on 3 methods, indication of data with the appropriate security, a doctor's appointment;
- 15 3. the algorithms on the basis of medical facts achieve points A - E (see p. 3);
4. the special input, display and security keys, the operation of the lamps and the dual function of the clock display as timer and data generator, e.g. for percentage reliability, numbers of days etc. [lacuna]